Code : 011724

B.Tech 7th Semester Exam., 2020

TRANSPORTATION ENGINEERING—II

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

(ii) There are ***NINE*** *questions in this paper.*

(iii) Attempt ***FIVE*** *questions in all.*

(iv) Question No. ***1*** *is compulsory.*

1. Choose the correct answer of the following (any *seven*) : 2×7=14

(a) Which of the following turnouts is most commonly used for goods train on Indian Railways?

(i) 1 in 8′/2

(ii) 1 in 12

(iii) 1 in 16

(iv) 1 in 20

(b) The height of the centre of arm of a semaphore signal above the ground is

(i) 5·5 m

(ii) 6·5 m

(iii) 7·5 m

(iv) 8·5 m

(c) The masonry arch bridge constructed in fourth seismic zone should have span

(i) not less than 10 m

(ii) not more than 5 m

(iii) not more than 10 m

(iv) between 10 to 15 m

(d) The impact factor for all gauges of rail bridges should not exceed

(i) 0·85

(ii) 0·50

(iii) 1·00

(iv) 0·35

(e) Howrah bridge (Rabindra Setu) is a

(i) cantilever-suspension bridge

(ii) cable-stayed bridge

(iii) suspension bridge

(iv) continuous bridge

(f) If G is gauge in metres, V is speed of trains in km/hour and R is radius of a curve in metres, the equilibrium super-elevation is

(i) GV^2/R

(ii) $GV^2/17R$

(iii) $GV^2/127R$

(iv) $GV^2/130R$

(g) The slipping of driving wheels of locomotives on the rail surface causes

(i) wheel burns

(ii) hogging of rails

(iii) scabbing of rails

(iv) corrugation of rails

(h) Weight and cross-section of the rails are decided on

(i) gauge of tracks

(ii) speed of trains

(iii) spacing of sleepers

(iv) All of the above

(i) Rail section is generally designated by its

(i) total weight

(ii) total length

(iii) weight per metre length

(iv) area of its cross-section

(j) In India, metre gauge permanent way was adopted in

(i) 1855

(ii) 1860

(iii) 1866

(iv) 1871

2. (a) In a 5° track diverges from a main curve of 3° in an opposite direction in a layout of a BG yard. If the speed of the branch line is restricted 35 kmph, determine the restricted speed on the main line. 8

(b) How the maximum permissible speed of a train is determined on a curved railway track in India? 6

3. *(a)* What are the different types of station yards? Explain the working of anyone with the help of the neat sketch. 7

   (b) How the railway stations are classified? What are the important factors to be considered while selecting a suitable site for railway station? 7

4. *(a)* State the parameter to considered while proposing type of bridges. 7

   (b) What are the causes of development of longitudinal forces? Explain the provision made for the longitudinal forces in a design of bridges in India. 7

5. *(a)* What is meant by tilting of caissons? What are its causes? How can a tilted caissons be brought in correct position? 7

   (b) Write an explanatory note on the rigid frame bridges. 7

6. *(a)* How the signals are classified? Explain clearly the location and the application of the following Railway signals : 8

   Outer signal, home signal, starter signal, advance starter signal, point indicator

   (b) Illustrate the various types of rail failure with sketches. 6

7. Differentiate between the following : 3½×4=14

   (a) U-abutment and T-abutment

   (b) Cut water and ease water

   (c) Cylinder pier and solid pier

   (d) Three-hinged arch and fixed arch

8. *(a)* What is the purpose of providing machine yard? What are the points to be considered in the design of marshalling yard? Also write the main features of marshalling yard. 9

   (b) State various types of resistance appearing due to speed of train. 5

9. *(a)* What are the various characteristics of the aircraft to be studied for airport design? Write a brief note. 7

(b) What is wind rose diagram? Explain the procedure of determining the runway orientation. 7

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